

MATH2111 Class Exercise 2

Family Name	Other Names	Student No.

CALCULATORS MUST NOT BE USED

1. Let $X = \{-2, -1, 0, 1, 2, 3\}$. Let a relation ρ on X be defined by $x \rho y$ if $x^2 - y^3$ is even.

(a) Write down ρ as a set of ordered pairs from X .

(2)

(b) Which ordered pairs must be included in any reflexive relation on X ?

(1)

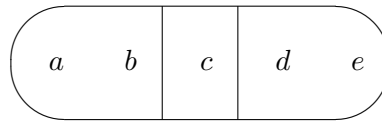
(c) Is ρ reflexive?

(1)

(d) Suppose that a relation on X includes $(-1, 2)$, $(1, 0)$ and $(2, 3)$. To be symmetric, what other ordered pairs would it have to include?

(1)

2. A partition π of the set $X = \{a, b, c, d, e\}$ is shown below.



Write down the partition as a set of disjoint subsets of X .

(2)

3. Suppose that $X = \{1, 2, 3\}$ and $Y = \{a, b, c, d\}$. Construct an example of each relation described below. In each case, specify the relation by describing it as a set of ordered pairs.

- (a) A relation σ between X and Y which is not a function from X to Y .

(1)

- (b) A function f from X to Y which is not one-to-one.

(1)

- (c) A function g from Y to X which is not onto.

(1)
